February 2013

The Remaining Eye

Quarterly newsletter on laser safety

Edited by Robert Fairchild, Deputy LSO

BERKELEY LAB

Environment / Health / Safety / Security DIVISION

In This Issue

Search for LSO

COMPLETE!! Please welcome Greta Toncheva.

(See page 6 for more info)

LASER Safety Web Page

If you have not visited the Laser Safety Web page, check L in the LBNL A-Z Index. You are missing out on a great deal of information

LANL ORPS

As mentioned in the previous newsletter, a worker at a DOE Lab was using a pair of dielectric coated (reflective) eyewear and viewed diffusely scattered 527nm laser light through the filter media. This specific model utilized a “notched” filter designed for OD7+@532nm. The spectral data sheet from the manufacturer indicated the optical density at 527nm is 3.1.

The worker stopped work and borrowed a similar pair of glasses from a coworker. They could no longer see the scattered “green” light.

The defective eyewear was taken out of service. No exposure to the worker was received from this event.

A quick check, using a laser pointer, was performed and it was discovered that there was a problem with a couple of centimeters in the center of both lenses. A transmittance check was performed and it was found that at the center of each lens, the OD was only 1.5 at 532nm.

(more on Page 2)

SEARCH FOR LSO IS OVER!!

On November 30, 2012, the EHSS Radiation Protection Group announced that Greta Toncheva has joined LBNL to assume management of the Laser and Non-Ionizing Radiation Safety programs. Many of you have had the opportunity to meet her already. To learn a little more about Greta, see page 6.

LANL ORPS *Continued*

This event just recently occurred, so the investigation is still not complete. One big question to be answered is, was the dielectric coating indeed defective, or was it badly worn from improper use or storage? Stay tuned….

One of the negatives mentioned concerning reflective eyewear is that it is angle sensitive. These filters are rated for an incident beam striking perpendicular to the media up to an angle of about 30 degrees off axis. As the angle of incidence increases, the beam undergoes a shift in wavelength moving it away from the "notched" protected wavelength. Simply put, you are not getting full protection and laser light may pass through the filter into your eye.

Also, if using a reflective "notched" filter that is rated for 532nm, it may not provide protection for a 527nm laser.
Verify applicability either with the manufacturer or your Laser Safety Officer.

This article was reprinted with permission of the author, Jamie King, LSO at LLNL.

For a list of eyewear suppliers, see the November edition of *The Remaining Eye.*

LASER SAFETY ZONE SUPPORT

It may surprise you to learn that there are approximately 90 Activity Hazard Documents (AHDs) that authorize laser use and approximately 250 active Class 3B and Class 4 lasers in use. In an effort to provide the best and most efficient customer service, laser safety support has been divided by building into 2 zones. The primary contact and backup contact is listed below each zone. Please contact your assigned primary contact for support. If the primary contact is away from the lab, please contact the backup for urgent assistance.

Zone One	*Zone Two*
Buildings	**Buildings**
2	1
16	6
26	62
55	66
58A	67
70	71
70A	72C
84	75 / 75B
	80
	976
LSO Greta Toncheva x 510/495-2544 C 510/605-8476	DLSO Robert Fairchild x 510/495-2278 C 510/926-2051
Backup Robert Fairchild x 510/495-2278 C 510/926-2051	Backup Greta Toncheva x 510/495-2544 C 510/605-8476

LASER SAFETY TRAINING CHANGES

The EHSS Radiation Protection Group (RPG) is always looking for ways to provide the most efficient customer support. After reviewing the laser safety training offered at LBNL, the RPG has determined that we can utilize your time more efficiently by streamlining laser safety training requirements. Below is a summary of former laser safety training requirements:

Existing
EHS 0288 Laser Eye Exam
EHS 0302 Laser Safety Training - online
EHS 0281 Refresher, due every 3 years
EHS 0303 Lessons Learned
EHS 0300 Fiber Optics Safety – one-on-one training

After reviewing EHS0281 Laser Safety Refresher, it was determined that the course covered the same information covered in the online EHS0302 Laser Safety Training. Since EHS0302 is presented in a newer interactive modular format that allows one to test out of modules for which one is familiar with the content, EHS0281 will be discontinued.

Retraining, which is required every 3 years will be completed by simply retaking the EHS0302, Laser Safety Training.

In addition, EHS0303 Laser Lessons Learned has been discontinued. Laser lessons learned are already addressed in the online EHS0302 training. This information will be updated as necessary to address current concerns and recent events. This change will save over 100 person-hours per year.

All personnel who use fiber optic lasers must take EHS0300 Fiber Optic Safety. This class is currently provided in the classroom as a one-on-one training. In an effort to provide efficient and timely training, this class will move to an online format in the near future.

Below is a summary of the new training requirements:

Effective January 18, 2013
EHS 0288 Laser Eye Exam
EHS 0302 Laser Safety Training – online Retraining every three years
EHS 0303 Lessons Learned Requirement removed
EHS 0300 Fiber Optics Safety – one-on-one training, contact LSO to schedule. Will go online

TRAINING CHANGES CONCERNS

As with all changes to requirements that are tracked in multiple systems, such as the AHD database and the Job Hazard Analysis (JHA) system, there will be some glitches in the implementation of the change. The LSO and DLSO have tried to anticipate areas where there may be problems and implement measures to prevent glitches in advance; however, if you encounter problems, please contact us to have them resolved ASAP.

LASER POINTER SAFETY

I know you are probably thinking "Oh no, not this issue again," but with the ever increasing availability of powerful laser pointers, it is critical to everyone's safety to understand what is considered a safe laser pointer and what is not. The following article first appeared in the November 12, 2012, Fermilab Today and reprinted here with permission of Fermilab and the author, Matt Quinn, Fermilab ES&H laser safety officer. Minor changes for LBNL specific policy have been made. For the original article, one may visit the Fermilab Today website at:

http://www.fnal.gov/pub/today/archive/archive_2012/today12-11-12.html

Caution with Laser Pointers

There are potentially significant hazards associated with laser pointers. High-power laser pointers can cause permanent eye damage in less time than it takes to blink. To avoid injuries, people should use laser pointers with a power output of 5 milliwatts or less.

Unfortunately, anyone can buy a laser that exceeds 5 mW thinking he or she is getting an FDA-compliant device. The higher-power devices look like, are marketed as, and can be priced like lower-power laser pointers. It is easy to find a 50-mW green-laser pointer on the Internet for $10. At this power, even a quick sweep across an eye can be hazardous.

Manufacturers often use the same external hardware for a range of laser products. The device on the left in the above-right picture is an FDA-compliant laser pointer with an output of 1 mW. The one on the right is a portable handheld laser rated at 200 mW. Even at Fermilab, several laser pointers labeled as having less than 5 mW of laser power were discovered to exceed the 5 mW limit.

Here are some ways to prevent eye injuries from laser pointers:

- Inform the LSO or Deputy LSO if you intend to use a laser at LBNL that exceeds 5 mW.
- Be familiar with the proper use of laser pointers by reviewing the laser pointer advisory on the laser safety web page.
- Only purchase products from reputable vendors to ensure the quality of the product.
- Read manufacturer specifications to make sure you're purchasing a product with the proper output.
- Do not stare into the beam.
- Be sure that children are supervised by an adult when using laser pointers.
- Do not point the beam at people, vehicles or shiny objects. The beam's reflection can cause damage.
- Do not point a laser at aircraft of any kind. It is a federal crime.

Both of these laser pointers look the same, but only one of them meets the 5-milliwatt-maximum requirement.

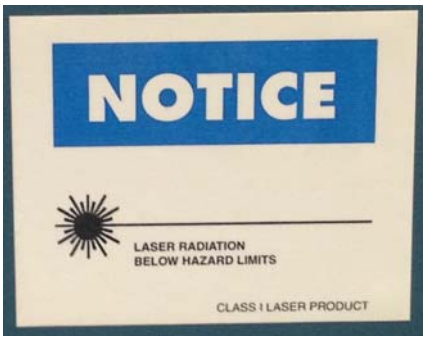
Photo: Fermilab ES&H

For more information on crimes involving laser pointers, visit the following web site:

http://www.fbi.gov/news/news_blog/laser-pointer-attacks-taking-off-pose-serious-threat-to-aviation-security

Class 1 Laser Products

It has recently been brought to the attention of the LSO that there are existing Class 3B or Class 4 lasers in operation at LBNL that do not have an AHD authorizing the work. These lasers are embedded in fully enclosed systems that although enclosed, are not interlocked. These systems were incorrectly classified as Class 1 Laser Products. Such systems require an AHD to identify the specific hazards of the system and how such hazards will be mitigated. If you are operating a Class 3B or Class 4 laser in a non-commercial enclosure, and the system is not authorized by an AHD with a laser schedule, please contact the LSO or DLSO, as appropriate for your zone, for an evaluation of your product.



Does your Class 1 Laser Product have the required label? If not, contact the LSO or DLSO, as appropriate for your zone, for an evaluation of your product.

Laser Safety Committee – Your Voice

Marc Hertlein writes:

I am the chair of the LBL laser safety subcommittee (LSC), which advises the lab on questions regarding laser safety, and makes recommendations on policies for the laser program. The policy questions we address are often issues that affect many laser users at LBL (including several of us who are active laser users ourselves), so the committee is very interested in your input. We would especially like to hear about any overarching issues that you encounter, or policy ideas which can improve and streamline your work with lasers.

For example, among the many topics the laser safety committee has discussed in the past were: reviewing recent laser incidences in the US and elsewhere and discussing any possible recommendations for LBL; the laser inventory at the lab; policies for using alignment lasers and laser pointers; dealing with laser lab access by facilities personnel and emergency teams; coordinating laser training for laser users working both at UCB and LBL; and a generic restart plan in the event of a laser accident.

Please don't hesitate to contact me, our new laser safety officers Greta and Bob, or any of the members on the committee, if you have any questions that affect policies in the laser safety program, and especially if you have suggestions that could make our work with lasers safer and easier.

--- Marc

Here are a few web sites:

The LSC is a subcommittee of the LBL safety advisory committee. Committee members are listed here: http://www.lbl.gov/ehs/sac/subcomms/lasersafety/membership.shtml

Minutes of past LSC meetings: http://www.lbl.gov/ehs/sac/subcomms/lasersafety/minutes/minutes.shtml

From Pub 3000: http://www.lbl.gov/ehs/pub3000/CH16.html

Laser Safety Committee (LSO, EH&S personnel, experienced laser users from Berkeley Lab)	• Recommends the establishment or modifications of Berkeley Lab laser-safety policies • Reviews laser-related accidents, if requested by the Safety Advisory Committee (SAC) or LSO • Reviews and approves protocols and interpretations made by the LSO • Reviews cases that involve repeated infractions of laser-safety rules, and recommends actions • Meets on a regular basis (quarterly at a minimum) • Reviews appeals and concerns from laser users (e.g., issues that may be in conflict with LSO determinations) and makes recommendations for their resolution

Introducing **Greta Toncheva**

Greta Toncheva joined EHSS and the RPG on November 26. She will be taking over the management of the Laser Safety Program with continued support from Robert Fairchild, the Deputy LSO.

Greta was born in Bulgaria where she attended the Plovdiv University and obtained her Master's degree in physics, specializing in solid state physics and optical electronics. After graduation in 1988, she joined her husband Anton Tonchev and they worked together at the Joint Institute for Nuclear Reactions in Dubna, Russia. She was involved in gamma and neutron activation analysis of ore samples using a 25 MeV Microtron electron accelerator.

In 1997 the family relocated to the USA. For the last 10 years Greta worked as a health physicist at Duke University where she conducted laser hazard evaluations and audits as a member of the laser safety team in addition to performing other health physics duties. Being a part of the high energy group at Duke, she participated at the ATLAS project by assembling detectors for the Large Hadron Collider at CERN, Switzerland. Greta also has extensive experience in use and calibration of radiation detection instruments. She used MOSFET and TLD technologies to measure internal organ doses and assess effective doses during common diagnostic procedures such as X-ray and Computed Tomography. This research resulted in more than 40 peer-reviewed publications including journals such as Health Physics, Medical Physics, Radiation Protection Dosimetry, and American Journal of Roentgenology.

Recently Greta and her husband relocated to Livermore, CA where her husband accepted a position with the physics division at the Lawrence Livermore National Laboratory. They have a daughter, Mirella who is an animator in New York.

Greta is very excited to join the Berkeley Lab and is looking forward to meeting all laser users and being a part of the laser-user community.